

CIA/ PB 131632-77

Approved For Release 1995/09/09 : CIA-RDP82-00111R000200780004-1

JULY 31 1959

UNCLASSIFIED- INFORMATION ON SOVIET
BLOC INTERNATIONAL GEOPHYSICAL COOPERATION
- 1959 1 OF 1

FDL
(2)

INFORMATION ON SOVIET BLOC INTERNATIONAL GEOPHYSICAL COOPERATION - 1959

July 31, 1959

U. S. DEPARTMENT OF COMMERCE
Office of Technical Services
Washington 25, D. C.

Published Weekly
Subscription Price \$12.00 for the Series

INTERNATIONAL GEOPHYSICAL COOPERATION PROGRAM --
SOVIET-BLOC ACTIVITIES

Table of Contents

	<u>Page</u>
I. General	1
II. Rockets and Artificial Earth Satellites	5
III. Meteorology	11
IV. Oceanology	13
V. Volcanology	15
VI. Arctic and Antarctic	19

I. GENERAL

IGY in Kazakhstan

An interview with Academician V. G. Fesenkov, director of the Astrophysical Institute of the Academy of Sciences Kazakh SSR, appeared in a recent issue of the Kazakhstanskaya Pravda. Prof Fesenkov presented certain preliminary results of the completion of the program of scientific investigations conducted in the Kazakh SSR.

The Kazakh Meteorological Institute, together with scientific institutions of the Academy of Sciences Kazakh SSR -- the Astrophysical Institute and its coronal station and the sectors of Astrobotany and Geography -- took part in the work of the International Geophysical Year.

The answers to a wide circle of problems fell to the Sector of Geography. The objects of its study: the Malaya Almaatinka glaciers of the Zailiyskiy Ala-Tau range and.... Baksan and Sarkand glaciers of the Dzhungarskiy Ala-Tau range.

The Sector of Geography's investigation of the temperature of the underlying surface, the moisture content, and the speed and direction of the winds in the 2-meter layer of air next to the glacier gave many new facts.

Interesting information was obtained as a result of the painstaking analysis of the structure of the snow, firn, and ice, their thermophysical and mechanical properties, their firmness at different temperatures and densities, and their coefficient of viscosity and other mechanical peculiarities. The determination of the temperature regime of the ice cover and, in particular, its heat conductivity, temperature conductivity, and density in regions of accumulation and thawing is of great value.

The thermophysicists of the Sector of Geography had the problem of investigating the temperature regime of the internal mass of the glaciers. Holes more than 25 meters deep -- in one case, 52 meters -- had to be drilled. It was established that subglacial thawing occurs not only in summer, but also in winter.

The scientific associates of the sector, for the first time in the USSR, successfully applied electrometric methods for studying glaciers. These methods made it possible to measure the specific electrical resistance, to conduct soundings of thick glaciers, and to determine the movement of the ice in the mass of the glacier. It was found that at a depth of 25 meters, the ice moves more slowly than at the surface, averaging 13-15 centimeters

per year. A scheme of the occurrence of perennial congelment which was compiled by the sector's glaciologists is of great scientific value. It produces the possibility of determining the parts of the moraine which are of danger to villages. Finally, a detailed study of the hydrological regime of the glaciers was made. This is necessary in order to determine their role in feeding rivers.

The outstanding event of the International Geophysical Year was the successful launching by the Soviet Union of the artificial earth satellites and the first artificial planet revolving around the Sun. Observations of the satellites are conducted at various points in the USSR.

Such an observation point was formed in the Astrophysical Institute. This is one of the most southern stations of the USSR and is located near Alma-Ata on the Kamenskiy Plateau, in a region with favorable climatic conditions.

The station is equipped with stationary instruments capable of recording the passage of the satellites only in periods of their comparative brightness. The use of the powerful meniscus telescope by the observatory was found to be most effective. On the initiative and under the leadership of D. A. Rozhkovskiy, Candidate of Physicomathematical Sciences, special attachments were created. With the aid of these, this telescope determines the coordinates of a satellite to an accuracy of within 1/1,000 part of a second.

A considerable part of the experiments connected with the development of this new apparatus was conducted by A. V. Kharitonov and V. S. Matyagin, associates of the Astrophysical Institute. Prof Fesekov notes that, despite very unfavorable weather conditions in 1958, 87 photographs of satellites suitable for precise processing were made.

The institute's coronal station is solving a most essential problem of the IGY. Each day, under the supervision of M. G. Karimov, Candidate of Physicomathematical Sciences, the internal solar corona is recorded with the aid of a special coronagraph. The data thus obtained are entered on charts and later published in a special bulletin. In addition, the results of the investigations are made up in the form of suitable tables and sent to the High Altitude Observatory in Colorado, US, which is a World Center for the collection of like materials. There is, weather permitting, daily continuous surveying of the solar chromosphere with the aid of motion-picture cameras in the red line of hydrogen. During the IGY period, more than 40,000 frames of the chromosphere in the red line of hydrogen were taken.

In addition, the coronal station is analyzing the most interesting individual frames with the aim of determining the character of the movement of coronal nodes and condensations and their connection with prominences. It was successfully established that the intensity of the magnetic fields in the solar atmosphere mainly determines the circumstances for the motion of coronal matter. The intensity of the magnetic fields also attests to the presence of a close connection of the matter in prominences with coronal matter. It follows that, with the motion of prominences, there obviously occurs an increase of coronal matter.

Systematic observations of emissions of the sky also enter into the compulsory program of the IGY. Since the beginning of the IGY, 217 spectra of the night sky have been obtained by the observatory. Another task is the maintenance of a patrol service for aurorae. During the course of the IGY, four aurorae, the brightest of which was that of 29-30 September 1957, were recorded. Also, observations on the total reflective capability of the Earth's globe were conducted. They will aid in perceiving the Earth as if from interplanetary space. On the basis of 38 series of observations it was concluded that the Earth reflects, on the whole, about 40 percent of the light it receives from the Sun into space.

Finally, says Fesenkov, one of the most important problems handed to the Astrophysical Institute in connection with the IGY program was the study of the interplanetary medium itself, through which the diverse effect of solar radiation descends to our planet. To gain the established goal, investigations were conducted on certain of the peculiarities of illumination -- Zodiacal light -- and appropriate observations were set up with the aid of special original instruments. Much material on this problem was obtained by an expedition headed by Prof Fesenkov in the Libyan Desert and in southern Egypt in the autumn of 1957. Owing to unavoidable disturbances of the Earth's atmosphere, the processing of this material was very difficult. The Sector of Machine Mathematics, under the supervision of M. V. Pentkovskiy, Academician of the Academy of Sciences Kazakh SSR, undertook the preparation of extensive computer tables for this purpose.

However, says Prof Fesenkov, on the basis of the materials collected by Soviet scientists, a new and original explanation of the nature of Zodiacal light and, with it, of the properties of the interplanetary medium suggests itself. Ye. V. Pyaskovskaya-Fesenkova, Doctor of Physicomathematical Sciences, investigated the effect of the scattering of sunlight caused purely by cosmic dust particles similar to those which are encountered in the high layers of the atmosphere. Ye. V. Pyaskovskaya-Fesenkova showed for the first time that these cosmic aerosols, i.e., cosmic dust, are capable of giving great polarization and of producing a scattering of light corresponding to the observed brightness of Zodiacal light. These aerosols, as can be shown, are the result of the disintegration of periodic comets and asteroids in particular.

Preliminary results of the fulfillment of the IGY program, concludes Prof Fesekov, graphically attest to the powerful force of scientific cooperation of the scientists of many countries when their endeavors are directed toward the fundamental interests of all the Earth's peoples. Such cooperation contributes to peace and furthers the improvement of living conditions on our planet. ("The International Geophysical Year in Kazakhstan," Alma-Ata, Kazakhstanskaya Pravda, 27 May 59)

II. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Report on 2 July Rocket Launching by Soviet Research Institute

A report on the flight of the geophysical rocket carrying two dogs and a rabbit on 2 July appears in the 8 July issue of Pravda. The report is purported to have been made by the scientific research institute [not further identified] in one of whose laboratories the animals "can now be seen...." The report follows.

"One of the most important and complex problems connected with the mastery of cosmic space is the problem concerning the biological effects of various flight factors and the state of weightlessness on a living organism -- its nervous activity, work capability, the coordination of movements, etc. The solution of these problems occupied a large place in the experimental launching conducted with the two dogs and the rabbit.

"During the flight, the basic vital functions of the experimental animals, blood circulation and breathing, were recorded with special apparatus, and the muscle tonus and reflexes, dependent on the position of the body in conditions of weightlessness, were studied. Motion pictures were taken during the flight recording the behavior of the dogs and the rabbit.

"A series of previously conducted investigations in similar conditions showed that the state of weightlessness, acceleration, and other factors did not have any significant effect on the organisms of animals. The flight is a new step in the solution of the problem of safely returning a container with experimental animals to Earth after traveling in the cosmos.

"This is not the first flight that the dogs Otvazhnaya and Snezhinka have made. Proof of the fact that these flights had no effect on their nervous activity, behavior, and health is that they were not afraid, after this, to enter a container and be subjected to different experiments. The training with the dogs which was conducted before the flight and after returning to Earth from a great altitude also contributes to this.

"The healthiest and quietest animals are selected for flights in rockets into the upper layers of the atmosphere. Over a long period of time, they become accustomed to being in the container where different instruments are located. Under laboratory conditions, the experimental "cosmonauts" become accustomed to enduring such factors as noise, vibration, and acceleration. A vibrostand, centrifuge, noise generator, and other instruments are used for this purpose. Such systematic training acquaints animals to endure calmly everything connected with cosmic flight.

"The launching of the ballistic rocket was accomplished successfully. At present, the careful processing and study of the numerous materials obtained as a result of the rocket's flight into the upper layers of the atmosphere is proceeding." ("Explorers of Great Altitudes," Moscow, Pravda, 8 July 59, p 4)

CPYRGHT

Another account of the training (similar in detail to the above report), as told to V. Parfenov, Engr-Lieutenant Colonel, by V. S. Georgiyevskiy and S. F. Sebezhko, scientific associates, appears in Sovetskaya Aviat-siya. Parfenov concludes his article by saying that "Soviet scientists have been studying the problem of the adaptability of animals to flights in rockets for a long time. The new, outstanding scientific experiment of our scientists indicates that they are close to the main goal of the investigation -- to the solution of the problem of Man's flight into the cosmos." ("Quadruped 'Explorers' of Great Altitudes," by V. Parfenov; Moscow, Sovetskaya Aviatsiya, 8 Jul 59, p 4)

CPYRGHT

CPYRGHT

Press Comment on 2 July Rocket Launching

Soviet newspapers continue to carry comments by Soviet and foreign scientists on the 2 July launching of the dog- and rabbit-carrying geophysical rocket. Some of the statements attributed to Soviet figures are noted here.

A. Mikhaylov, Corresponding Member of the Academy of Sciences USSR, director of the Pulkovo Observatory, speaks of the great number of scientific observations made possible by the variety of scientific apparatus which the rocket carried. Information on the composition of light gases in the atmosphere were obtained for the first time. These data are of enormous interest in the study of the geophysical phenomena in the atmosphere. "As is known" he says,

CPYRGHT

"if constant and continuous intermixing did not occur in the Earth's atmosphere, then its different gases would be stratified because of gravity. Then, the heavier gases would be found at the very surface of the Earth, while the lighter gases, helium and hydrogen, would compose the upper part of the atmosphere. But the Earth's atmosphere is constantly agitated by the action of vertical air currents which reach to very great altitudes. The data obtained concerning the light gases in the upper layers of the atmosphere make it possible to judge what effect these currents have on the state of the atmosphere.

CPYRGHT

CPYRGHT

"Important data are being obtained concerning the effect flights in rockets have on a living organism. Information on the adaptability of animals which have already been repeatedly lofted to great altitudes and on the behavior of animals in a state of weightlessness are especially valuable.

CPYRGHT

"The new, successful launching of the rocket is a positive contribution to science on the Earth and its atmosphere and still another step along the path to conquering space. It attests to the use by the forces of Soviet science of their achievements in the interest of peace and science." ("In the Interests of Peace and Progress," by A. Mikhaylov; Moscow, Pravda, 8 Jul 59, p 1)

N. A. Dobratin, deputy director of the Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR, says that the launching of the 2 July rocket is another step by Soviet science along the path of a deeper and more detailed study of cosmic space. The 2 July launching attracts attention to itself by the complexity of the scientific problems advanced. Here, the most pressing problems of modern physics, astronomy, biology, and medicine were touched upon.

The launching of the rocket coincided with the work of the International Conference on Cosmic Rays being held in Moscow, says Dobratin. The report of the launching caused a great deal of interest among the foreign and Soviet scientists attending. ("New Victory of Our Science," Moscow, Pravda, 8 Jul 59, p 1)

P. K. Isakov, Candidate of Biological Sciences, Chairman of the Committee on Space Medicine of the Section of Astronautics Dosaaf [Volunteer Society for Cooperation With the Army, Air Force, and Navy], writes:

"The launching of a geophysical rocket with equipment and experimental animals into the upper layers of the atmosphere has great scientific value. Biological experiments, as is known, require repeated confirmation. This is explained by the fact that a living organism does not always endure various actions in the same way. An organism can react differently to one and the same excitation in relation to its condition at the time of the experiment, to previous influences, and to the concrete condition of the experiment. Only after the conduct of repeated tests under new conditions, is it possible to arrive at conclusions on functional changes during space flight. That is why each successive ascent of animals in rockets adds entirely new scientific facts of a medical-biological nature.

"In the Tass report, it was pointed out that a rabbit shared the container together with the dogs. This emphasizes the tendency of Soviet scientists to broaden the possibilities of the investigations being conducted by means of using different types of animals. It is known that each animal possesses a resistance to certain external actions, and, conversely, it is less suited to other influences. Therefore, scientific information obtained in studying the reactions of different types of animals gives a more complete picture of changes in the animal organism. This is precisely what is necessary for a more complete picture of changes in an animal organism and for a more basic solution of the medical-biological problems of future manned space flights.

"In this case, the participation of a rabbit in the experiment makes it possible to obtain scientific materials concerning changes in the functions of an organism less resistant to the action of acceleration than dogs. It is possible that such a case would also pertain to the effect of weightlessness on the rabbit. As this is its first ascent in a rocket, it is impossible to predict, at present, which changes in its organic structure will differ from the reactions of, for example, dogs.

"The arrangement of the three animals in the container at one time is the next important circumstance of the launching of the rocket. This makes it possible to examine several variations of the conditions being created for each animal, in particular, in one experiment. It can reveal, in particular, information in regard to the method of fixing the animals, to their shifting inside the container relative to the direction of the rocket's flight, to various methods of creating living conditions, etc. To sum up, different characteristics in the reactions of organisms can be obtained for wholly identical influences (the effects of acceleration, vibration, motor noise, weightlessness, etc.). Such an arranged experiment will undoubtedly expand scientific knowledge concerning the effects of conditions created in space flight.

"Finally, it is impossible not to mention the value of repeated loftings of one and the same animal in rockets. In this launching, the dog Otvazhnaya was lofted to a great altitude for the third time. This can serve as a reliable indicator of the harmlessness of such trips for a living organism. Of course, the final answer to this problem can be compiled only after the processing of the scientific materials of the flight and as a result of subsequent observations of the animals.

"In conclusion, it is necessary to underline the routine success of Soviet scientists who are paving the way into space." ("Great Success of Soviet Science," by P. K. Isakov; Moscow, Sovetskaya Aviatsiya, 8 Jul 59, p 1)

V. Parin, active member of the Academy of Medical Sciences USSR, says that a principal feature of the latest experiment conducted by means of the geophysical, single-stage ballistic rocket is the observation of the coordination of muscular movements and the functional condition of the muscular system of animals. This field of investigation is extremely important. It is necessary to know how the pilots of future space craft, faced with a myriad of complex control problems, will behave in conditions of weightlessness. It is necessary to know for how long he loses orientation in space and whether he can regulate his own movements. ("A New Rocket, A New Contribution to Science," by V. Parin; Moscow, Izvestiya, 8 Jul 59, p 3)

Previous physiological data, already obtained through the launching of Sputnik II with the dog Layka aboard, answered a number of important questions and gave new scientific facts, such as the possibility of the survival of an animal in conditions of weightlessness, enormous accelerations, and intense streams of radiation, says Ye. Kreps, Corresponding Member of the Academy of Sciences USSR.

CPYRGHT

He concludes that:

CPYRGHT - conduct a whole series of biochemical studies of the experimental animals to study the effect of the flight on all of the functions of the organism and on the hemopoietic organs and other systems which are especially sensitive to the effects of radiation. Investigations of the effects of flight conditions on the central nervous system are of definite interest. The study of the effect of a prolonged stay in the upper layers of the atmosphere (as well as cosmic space) on the central nervous system of a highly developed animal, such as a dog, acquires special interest in connection with repeated flights of animals.

CPYRGHT "Soviet scientists are very proud that the new science 'space physiology' is being successfully developed in our country, which is building a Communist society." ("This is Very Interesting," by Ye Kreps; Moscow, Izvestiya, 8 Jul 59, p 3)

Prof M. Budyko, Lenin Prize Winner and director of the Main Geophysical Observatory imeni A. Voyeykov, says:

CPYRGHT "The study of the physical processes in the upper layers of the atmosphere is necessary for an understanding of the general laws of the formation of climate and changes in weather. Therefore, each new success in the firings of geophysical rockets and in the observations with artificial earth satellites opens broad prospects for solving many actual problems of meteorology, including the problem of developing methods of forecasting the weather.

"Observations by the new geophysical rocket should help us explain the conditions of the movements of air currents at great altitudes which differ sharply, in this regard, to the well-studied lower layers of the atmosphere.

"The measurement of the Sun's ultraviolet radiation is of great interest. This radiation, to a very great degree, is absorbed in the atmosphere, making it impossible to measure it with any degree of accuracy on the surface of the Earth.

CPYRGHT "The material on investigations of the upper layers of the atmosphere obtained with the aid of rockets which is already available has caused a complete revision of earlier existing presentations of the mechanism of many atmospheric processes. It is possible, no doubt, that future works in this field will lead to successes in the study of the physics of the atmosphere, of which until recently we could only dream." ("Interesting Prospects," by M. Budyko; Moscow, Izvestiya, 8 Jul 59, p 3)

Venus and Mars Rockets

G. A. Tikhov, Corresponding Member of the Academy of Sciences USSR, in answering questions of Krasnaya Zvezda readers concerning knowledge of the universe, discusses the existence of life on other planets, the work of astrobotanists, and space travel.

In the question of life on other planets, the study of its properties and the reasons for its origin is important. The planets of the solar system offer rich possibilities in this regard since they are in the most varied stages of development. The youngest in this sense are those planets farthest from the Sun -- Jupiter, Saturn, Uranus, and Neptune. Then, Venus is probably next, and, finally, the Earth and Mars. Regarding the planets nearest the Sun, Mercury and the Moon, as a consequence of their small mass, they long ago lost their atmosphere and water through evaporation and dissipation in space.

Very little is known of Venus' surface or Mars' atmosphere, and opinions concerning life on these planets are not in agreement. While it is true that astrobotany has proved the existence of plant life on Mars similar to that on Earth, there still remain scientists who do not agree on this point.

The first artificial planet of the solar system launched by the Soviet people will revolve around the Sun as long as the other planets, and now the sole remaining matter is the precise calculation of the speed and direction of launching of the following rockets so that they will land on Venus and Mars. If conditions are created inside of such rockets favorable for human life for a long period (over 6 months), then flights by daring explorers to these planets are not far off. But even before this, it will be possible to equip artificial planets with automatic apparatus which will make it possible to obtain interesting information concerning Venus and Mars from a close distance and to transmit it to Earth.

The first astronomical investigations will most probably be made in regard to the Moon, says Tikhov. Despite its nearness to Earth, very little is known concerning almost half of its surface. Even on the visible side, phenomena still arise which cause us to change our conception of its internal structure. The observation of volcanic activity in the lunar crater of Alphonsus by N. Kozyrev, Soviet astronomer at the Crimean Astrophysical Observatory, is an example of such an occurrence. ("Becoming Acquainted with the Universe," by G. A. Tikhov; Moscow, Krasnaya Zvezda, 30 Jun 59, p 3)

Hungarian Tracking Station at Rakosliget Described

The artificial satellite tracking station at Rakosliget, recently completed by Hungarian scientists, is described in a Belgian source.

The station has a rotating antenna, operating on a wave length of 7.5 meters, situated atop a tower 29 meters high. The short-wave receiving set used in the installation has a sensitivity greater than one micro-volt. This is important in detecting the presence of satellites and cosmic rockets. It is reported that Hungarian scientists can already pick up signals of satellites within a circumference of 800 kilometers from the station. As to cosmic rockets, the receiving set is said to be capable of picking up their signals even at a distance of 500,000 kilometers. ("News Items From Socialist Camp -- Satellite Observing Station," Brussels, Le Drapeau Rouge, 11 Jun 59, p 2)

III. METEOROLOGY

Simplified Formulas Used To Analyze Weather Data

An analysis of experimental data was made with simplified local-pressure-change formulas adapted to operational conditions. The results indicate to what degree these formulas, and another simplification introduced into the derivation of the formulas, influence the quality of a diagnosis and prognosis.

An evaluation of the role of thermal and nonthermal factors in the local change of pressure under various atmospheric conditions is also given, as is the degree to which the vertical velocity and change of pressure at the Earth's surface depend on the stratification of the atmosphere and the latitude of the location. ("Analysis of Local Changes of the Absolute Geopotential and of the Pressure at the Earth's Surface," by I. P. Vetlov; Moscow, Trudy Tsentral'nogo Instituta Prognozov, No 70, 1958, pp 13-54)

Pre-IGY Hydrometeorological Survey in Caspian

A report on hydrometeorological surveys in the region of Neftyanyye Kamni in the Caspian Sea discusses measurement data, collected January 1956-March 1957, on sea agitation, water currents, and the vertical gradients of wind, temperature, and humidity. The Neftyanyye Kamni station is located on the open sea, at the end of a scaffold bridge, in an offshore petroleum field located 40 15 N and 50 50 E in 11.6 meters of water.

The station regularly conducts meteorological and hydrological surveys, including investigations of currents and the temperature and specific gravity of the water at various depths. Water currents are measured systematically four times during the 24-hour day (0000, 0600, 1200, and 1800 Moscow time) at depths of 0.5, 3.5, and 10 meters. Water temperatures are recorded at 0000 and 1200 Moscow time at all levels. Waves are measured at the station with a wave meter-perspectometer and a wave-measuring rod at 0100, 0700, 1300, and 1900 mean solar time and 0300, 0900, 1500 and 2100 Moscow time. During storms, the periods and heights of waves are also measured with the "GOIN" wavemeter. The gradient installation is on an oil-well derrick located 5 kilometers northwest of the station and contains electrical contact anemometers, thermister psychrometers, and Surazhskiy delayed-action anemometers. The gradient measurements of the wind, temperature, and humidity are conducted up to 50 meters above the surface of the water.

During a period of storms, from November 1956 to March 1957, a hydrological post was set up in the region between Neftyanyye Kamni and the island of Zhiloy, on an isolated scaffold bridge, in 25.8 meters of water, 11 kilometers to the west-northwest of the station. The wave meter-perspectometer was used in the wave studies, and the heights and periods of waves were measured with the "GOIN" wave graph. Currents were recorded at depths of 0.5, 5, 10, 20, and 25 meters. Wavemeter stations, equipped with wave measuring rods, were set up at the four most representative points of the scaffold bridge; during the stormy weather, periodic simultaneous measurements of the height and periods of the waves were made at these four posts, and simultaneous measurements were also made of the direction and speed of the water currents.

In addition to the above work, monthly hydrological surveys were conducted in the region of Neftyanyye Kamni, on the cutter "Okeanolog", along the three standard routes from Neftyanyye Kamni to the island of Zhiloy; and periodic cross sectional surveys of currents were made on supplementary routes to the north, east, and south of Neftyanyye Kamni. During March 1957, the station, together with the Baku Hydrometeorological Observatory also conducted a hydrological survey in the region of Neftyanyye Kamni on two ships, the Okeanolog and the Razrez.

This work was conducted by associates of the hydrometeorological station at Neftyanyye Kamni, under the direction of Ye. M. Kopaygorodskiy, the chief of the station. Contributing authors to this article are: V. G. Pavlenko, M. U. Vapnyar, G. I. Shevelev, N. N. Mekhtiyev, I. V. Shabalin, V. A. Lyubanskiy, V. S. Krasnyuk, and Ye. M. Kopaygorodskiy.

The quality and quantity of the collected data on the wind gradient are already sufficient to provide a solution to the problem of estimating the force of the wind at offshore oil well installations. Future gradient observations must be modified slightly in order to be applicable to other problems as well, particularly that of measuring the factors which make up the thermal balance of the sea.

An analysis of part of the data on gradient observations has confirmed the conclusion of the State Oceanographic Institute to the effect that a logarithmic curve of distribution can be used for the transition from the velocity of the wind at the height of the weather vane (or wind sock) to the velocity at another height (up to 50 meters) when winds are average to strong.

The collected data on agitation are not yet sufficient for the construction of an agitation chart for the region. The synchronized measurements of the agitation of the water at various stations must be continued, and additional agitation measuring stations must be set up.

The computed value of the maximum current in the region (with a wind of 34 meters per second) was shown to be 90 centimeters per second, in contrast to a previously computed value of 75 centimeters per second.

The surveys on board the two ships have provided improved current measurements in the region; further study with automatic recording devices is necessary in order to obtain information in the over-all current system in the eastern Neftyanyye Kamni region. ("Some Results of Hydrometeorological Observations and Operations of the Hydrometeorological Station Neftyanyye Kamni of the Administration of the Hydrometeorological Service of the Azerbaydzhan SSR in the Period January 1956 to March 1957," by A. D. Babayev et al; Moscow, Trudy Gosudarstvennogo Okeanograficheskogo Instituta, No 43, 1958, pp 5-52)

IV. OCEANOLOGY

Three-Month Atlantic Voyage Completed by Mikhail Lomonosov

The Mikhail Lomonosov, expeditionary ship of the Academy of Sciences USSR, has arrived at the port of Kaliningrad after a voyage of more than 3 months. During this period, investigations according to the program of the International Geophysical Year were conducted along the 30th meridian from the shores of Iceland down to 23 S. About 15,000 miles were covered. Studies were conducted on the basic problems of the variability of the thermal and chemical properties of the waters, the regimen of oceanic fronts, bottom relief of the ocean, etc.

The expedition was headed by A. A. Ivanov, Doctor of Physicomathematical Sciences. Modern methods of marine investigation were used for measuring the temperature and salinity of the ocean waters. Registration of water and air temperatures was made automatically. ("From a Voyage Along the 30th Meridian," by M. Bogorodskiy and S. Strekalov; Moscow, Izvestiya, 8 Jul 59, p 6)

V. VOLCANOLOGY

Forthcoming Conference on Volcanology in Armenia

CPYRGHT

"The First All-Union Volcanological Conference will be held this year from 23 September to 5 October in Yerevan.

"It is not mere chance that the first conference of Soviet volcanologists is being held in Armenia.

"Throughout the history of its geological development, Armenia has been an arena of repeated volcanic eruptions. The widespread and diversified volcanic products and excellently preserved centers of recent eruptions places Armenia among the classic volcanic regions of the world.

"In the USSR, with respect to scope of volcanic processes, Armenia is surpassed only by the Kamchatka Kurile Chain, where active volcanoes exist even today.

"The study of volcanoes and their products is not only of scientific, but also of great economic, significance. Many valuable products, such as ores and nonmetallic minerals (pyrite deposits of copper, lead and zinc of the Alaverdi-Kafan type; deposits of iron and manganese of the effusive-sedimentary type; deposits of gold, silver, natural sulfurs, borates, agate, Iceland spar, and others), are connected with the activities of active and dormant volcanoes accompanied by gaseous streams from fumaroles and solfatara.

"Great practical importance has also been acquired by products of volcanic eruptions which are being employed in diversified fields of the national economy. A considerable portion of the total Soviet resources of building materials of volcanic origin are found in Armenia. Among these, the leading position is held by basalts, andesites, tuffs, perlites, pumices, and other materials. Volcanic products are also being used in the chemical industry (perlites, obsidianites, and others), the refractory industry (basalts, andesites, and tuffs), and in high-quality hydraulic materials (volcanic ash).

"Hot mineral springs of great salutary value and resources of subterranean heat which could be employed in power engineering are also tied in with volcanism.

"An Orgkomitet (Conference Organizational Committee) has been formed for the purpose of conducting the conference at a high level to ensure significant theoretical and practical results.

"Staff of the Orgkomitet consists of:

1. I. G. Magak'yan, Academician of the Academy of Sciences Armenian SSR-- Chairman
2. G. D. Afanas'yev, Corresponding Member of the Academy of Sciences USSR-- Vice-chairman
3. V. I. Vlodavets, Doctor of Geological-Minerological Sciences -- Vice-chairman
4. B. I. Pilyp, Corresponding Member of the Academy of Sciences USSR -- Vice-chairman
5. K. G. Shirinyan, Candidate of Geological-Minerological Sciences, Institute of Geological Sciences of the Academy of Sciences Armenian SSR -- Vice-chairman
6. E. G. Malkhasyan, Candidate of Geological-Minerological Sciences, Institute of Geological Sciences of the Academy of Sciences Armenian SSR -- Scientific secretary
7. Ye. V. Sveshnikova, Candidate of Geological-Minerological Sciences, Institute of Geological Sciences of the Academy of Sciences Armenian SSR -- Scientific secretary.

"Members of the Orgkomitet consist of:

1. Kh. M. Abdullayev, Corresponding Member of the Academy of Sciences USSR
2. A. A. Adamyan, Candidate of Geological-Minerological Sciences, Institute of Geological Sciences of the Academy of Sciences Armenian SSR
3. G. M. Arutyunyan, Armenian Geological Administration
4. A. T. Aslanyan, Doctor of Geological-Minerological Sciences, Armenian Geological Administration
5. R. B. Baratov, Corresponding Member of the Academy of Sciences Tadzhik SSR
6. G. P. Bagdasaryan, Candidate of Geological-Minerological Sciences, Institute of Geological Sciences of the Academy of Sciences Armenian SSR
7. V. A. Vakar, Doctor of Geological-Minerological Sciences, Institute of the Geology of the Arctic

8. G. M. Gapeyeva, Doctor of Geological-Minerological Sciences, All-Union Geological Scientific Research Institute
9. G. S. Gorshkov, Candidate of Geological-Minerological Sciences, Laboratory of Volcanology of the Academy of Sciences USSR
10. G. S. Dzotsenidze, Academician, Academy of Sciences Georgian SSR
11. M. A. Kashkay, Academician, Academy of Sciences Azerbaydzhan SSR
12. A. P. Lebedev, Doctor of Geological-Minerological Sciences, Institute of the Geology of Ore Deposits, Petrography, Minerology and Geochemistry of the Academy of Sciences USSR
13. I. V. Luchitskiy, Doctor of Geological-Minerological Sciences, Western Siberian Branch of the Academy of Sciences USSR
14. S. S. Mkrtchyan, Academician, Academy of Sciences Armenian SSR
15. S. I. Naboko, Candidate of Geological-Minerological Sciences, Laboratory of Volcanology of the Academy of Sciences USSR
16. K. N. Paffengol'ts, Academician, Academy of Sciences Armenian SSR
17. V. P. Petrov, Doctor of Geological-Minerological Sciences, Institute of the Geology of Ore Deposits, Petrography, Minerology and Geochemistry of the Academy of Sciences USSR
18. K. I. Satpayev, Academician
19. A. Ye. Svyatlovskiy, Candidate of Geological-Minerological Sciences, Laboratory of Volcanology of the Academy of Sciences USSR
20. V. S. Sobolev, Academician
21. T. Sh. Tatevosyan, Candidate of Geological-Minerological Sciences, Yerevan State University
22. I. S. Usenko, Candidate of Geological-Minerological Sciences, Institute of Geological Sciences Ukrainian SSR
23. Ye. K. Ustiyev, Doctor of Geological-Minerological Sciences, Institute of the Geology of Ore Deposits, Petrography, Minerology and Geochemistry of the Academy of Sciences USSR
24. M. A. Favorskaya, Doctor of Geological-Minerological Sciences, Institute of the Geology of Ore Deposits, Petrography, Minerology and Geochemistry of the Academy of Sciences USSR

25. G. V. Yakovleva, Moscow State University.

"The following four problems are included in the program of the First All-Union Volcanological Conference: .

1. Active volcanism and principles in its study
2. Volcanism and tectonics
3. Volcanogenic formations and related mineral products
4. Symposium on terminology and classification of volcanogenic rocks.

"Persons have been selected to take charge of each of the indicated problems .

"After the meetings, which will continue for 5 days, excursions will be held to sights in the volcanic regions of Armenia. The Orgkomitet has confirmed the following excursion routes:

1. Yerevan-Avan-Garni-Gegard
2. Yerevan-Pambak
3. Yerevan-Ashtarak-Artik-Aparan-Golgat-Yerevan
4. Yerevan-Nakhichevan-Goris
5. Goris-Lachin-Stepanakert-Goris
6. Goris-Dzhermuk
7. Dzhermuk-Yekheknadzor-Martuni-Kamo
8. Kamo-Sevan-Yerevan
9. Yerevan-Mt. Aragats

"Thirty-three geological organizations of the Soviet Union and also scientists-volcanologists from foreign countries will participate in the conference. Ninety-eight reports will be read and discussed at the conference.

"A collection of abstracts of conference reports and an excursion guidebook are being published at the present time.

"The forthcoming First All-Union Volcanological Conference, which is to be held in Yerevan, is a great event in the scientific life of geologists, particularly those of Armenia, and confers a great responsibility upon them."

("Concerning the Calling of the First All-Union Volcanological Conference in the City of Yerevan," by the Conference Organization Committee; Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR, Seriya Geologicheskikh i Geograficheskikh Nauk, Vol 12, No 3, 1959, pp 63-65)

VI. ARCTIC AND ANTARCTIC

Soviet Scientist Contributes to Study of Antarctic

Georgiy Mikhaylovich Tauber, senior scientific associate of the Oceanographic Institute, Hydrometeorological Service, is one of the pioneers in the exploration of the Antarctic. While studying at the Moscow Meteorological Institute, he became interested in the expeditions of the Second International Polar Year (1932-1934). During that period, the student Tauber wintered at Dudinka and Dikson. His participation in a 2-year expedition later enabled him to defend his diploma dissertation on the subject "Characteristics of the Air Masses on Ostrov Dikson."

In 1947 Tauber defended his candidate's thesis and left on a long voyage on the Slava. At that time, the first scientific group of an antarctic expedition was formed within the Slava whaling flotilla. As a result of two expeditions on the Slava, the scientists was able to collect a great deal of material and to compile descriptions of the main physico-geographical features of the Antarctic. This material, which was of great interest for navigators, as well as for all other persons interested in the Antarctic, was included in the first monograph published on the Antarctic.

After the publication of this monograph, Tauber again took part in a long-distance expedition. He wintered at Mirnyy as chief of the aerometeorological detachment. As a result, he published "Supplementary Notes" to his scientific work.

Tauber has written a total of 35 scientific works, which he summarized in his thesis for the academic degree of Doctor of Geographical Sciences. The subject of his thesis, "The Antarctic (Main Features of Climate and Weather)," attracted the attention, not only of scientists, but also of many partical specialists.

On the basis of collected data on the atmospheric circulation in the region of antarctic waters, G. M. Tauber compiled synoptic charts. With the help of these, he was able to compile a collection of maps showing the centers of cyclones and anticyclones for each month during three whaling seasons, as well as maps and tables indicating the repeated occurrence of cyclones of varying intensity. He successfully compared the temperature and wind regimes of the atmosphere over the Arctic and Antarctic. His conclusions may serve as the basis for ensuring navigational safety for ships and aircraft in the Antarctic. G. M. Tauber has now been awarded the academic degree of Doctor of Geographical Sciences.

In studying the subject of antarctic winds, G. Tauber and his co-workers established four different stations at various altitudes (1) at a distance of 25 kilometers from Mirnyy, at an altitude of 600 meters; (2) at a distance of 10 kilometers, at an altitude of 400 meters; (3) on the coast, and (4) on the sea ice, 14 kilometers away from the shore. These stations were established during August, the coldest month of the year, and provided very interesting material describing the characteristics of winds blowing off the interior as a result of the force of gravity on the glacier slopes. All of this information was completely new. Not one foreign expedition had previously conducted similar observations.

Tauber summarized the results of observations at these portable stations. The report was sent to an international symposium taking place in Australia. In 1959, this valuable material composed by the Soviet scientist will be published in a special collection. ("Explorer of the Ice Continent," Moscow, Moskovskaya Pravda, 13 Jun 59)

Polish Expedition to Spitsbergen

A Polish expedition departed from Gdynia for Spitsbergen on 3 June to conduct exploration in connection with the IGY. The expedition, consisting of 31 persons headed by Dr Stanislaw Siedlecki, will explore the Koerber Glacier and the peaks of South Cape Island. ("Polish Expedition to Spitsbergen," Oslo, Friheten, 4 Jun 59)

* * *